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A new species of *Clitopilus* from southwestern China

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Abstract — *Clitopilus ravus* is described and illustrated as a new species from southwestern China. It is characterized by its tawny gray or grayish brown to brown tomentose pileus, absence of pleuro- and cheilocystidia, subfusiform to amygdaliform basidiospores with 4–5 prominent longitudinal ridges, and cylindric or clavate terminal cells of the pileipellis filled with brown non-encrusting intracellular pigment. Comparisons with similar taxa and photographs and drawings of its macroscopical and microscopical characters are provided.

Key words — taxonomy, *Entolomataceae*, macrofungi

Introduction

The genus *Clitopilus* (Fr. ex Rabenh.) P. Kumm. traditionally encompasses three sections: *Clitopilus*, *Pleurotelloides*, and *Scyphoides*. Section *Clitopilus* is characterized by its medium-sized to rather large basidiomata, distinct and persistent stipe, spores with mostly six reinforced longitudinal angles and usually 10–14 µm long (Singer 1986). Seven species have been reported in sect. *Clitopilus*: *C. prunulus* (Scop.) P. Kumm., *C. lignyotus* Hongo, *C. quisquiliaris* (P. Karst.) Noordel., *C. paxilloides* Noordel., *C. griseobrunneus* T.J. Baroni & Halling, *C. amygdaliformis* Zhu L. Yang, and *C. chrischonensis* Musumeci et al. (Singer 1946; Hongo 1954; Noordeloos 1982, 1993; Baroni & Halling 2000; Yang 2007; Vizzini et al. 2011).

We describe and illustrate here a new species of sect. *Clitopilus* discovered during re-examination of *Clitopilus* specimens collected from Yunnan Province.

Materials & methods

Specimens were annotated and photographed in the field, and dried in an electric drier. Color description was according to Kornerup & Wanscher (1978). We examined

spores, basidia, and cystidia in 5% KOH or 1% Congo Red and the pileipellis in 5% KOH. Basidiospore dimensions follow the notation (a–)b–c(–d), with at least 25 basidiospores measured and with the range b–c representing 90% or more of the measured values and the extreme values 'a' and 'd' given in parentheses. Abbreviations are L_m = average length of all basidiospores ± sample standard deviation, W_m = average width of all basidiospores ± sample standard deviation, Q = individual basidiospore length/width ratio, Q_m = average Q of all basidiospores ± sample standard deviation, and n = number of spores measured per specimen.

Micrographs were taken using an Olympus BX51 trinocular phase contrast microscope and a Philips FEI-XL30 scanning electron microscope. The dried studied specimens are deposited in the Herbarium of Cryptogams, Kunming Institute of Botany, Chinese Academy of Sciences (KUN, with HKAS numbers).

Taxonomy

Clitopilus ravus W.Q. Deng & T.H. Li, **sp. nov.** Fig. 1

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Differs from *C. griseobrunneus* by its much smaller basidiospores and non-encrusting pigment in pileipellis.

Type: China, Yunnan Province, Jingdong County, Ailaoshan National Nature Reserve, 14 July 2008, Yanchun Li 1213 (**Holotype**, HKAS 56067).

Etymology: *ravus* refers to the tawny gray or grayish brown color of pileus and stipe.

Pileus 30–40 mm broad, convex at first, then applanate, tawny gray or grayish brown to brown (6D3, 6D–E5); brown (6E5) overall under lens, tomentose; margin incurved, not striate. Lamellae white but soon pale flesh-pink to pink (7A1–2), decurrent, close to crowded; edges concolorous and even; lamellulae numerous. Stipe paler than pileus to partially concolorous with pileus, orange gray (6B2), brownish orange (6C3) to light brown (6D4), with white (6A1) cottony mycelium at the base, 35–45 mm long, 4–6 mm thick at the apex, 7–12 mm thick at the base, tomentose, inconspicuously striate, central to slightly eccentric, often slightly curved, cylindrical, usually broadening towards base. Context white (6A1), unchanging when bruised or exposed to air.

Basidiospores 11–13(–14) × (5–)5.5–6.5(–7) µm, (n = 25, L_m = 12.02/± /0.96, W_m = 6.06/± 0.46, Q = (1.57–)1.83–2.33(–2.80), Q_m = 1.99 ± 0.25), slightly pinkish to nearly colorless and hyaline, slightly thick-walled, amygdaliform or subfusiform with longitudinal ridges in profile and face views, angular in polar view with 4–5 facets separated by obvious rounded ridges. Basidia (22–)27–35 × 10–13 µm, clavate, hyaline, 4-spored; sterigmata 2.5–3.0 µm long. Subhymenium composed of hyphal elements 5–9 µm in diam. Lamellar trama composed of cylindric, hyaline hyphae 2–6 µm in diam. Pleurocystidia and Cheilocystidia absent. Pileipellis a trichoderm composed of repent, cylindric or inflated, 5–11 µm wide hyphae; terminal cells cylindric or clavate,

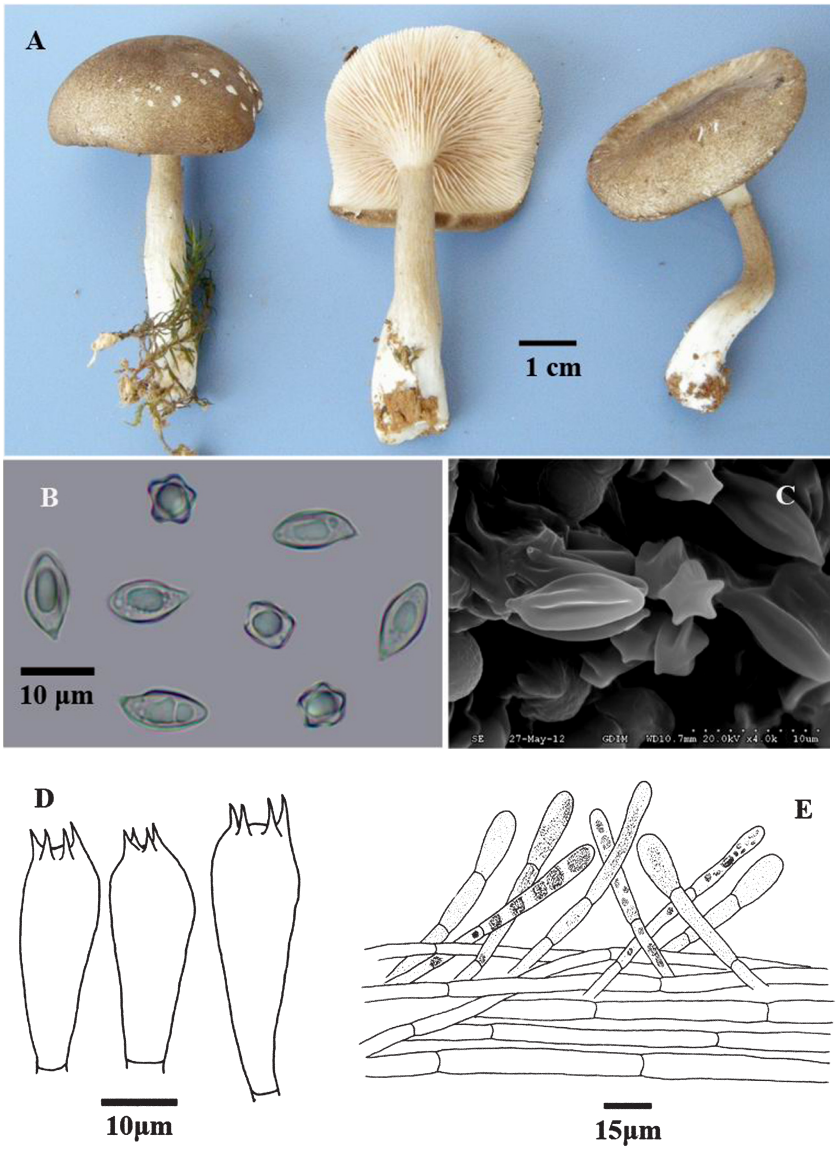

Fig. 1: *Clitopilus ravus* (holotype).
A. Basidiomata.
B. Basidiospores in LM (×1000). C. Basidiospores under SEM. D. Basidia. E. Pileipellis.

15–38 × 5–11 μm; brown, intracellular, non-encrusting pigments, some hyphae have thickened walls. Clamp connections absent in all tissues.

Ecology & distribution — Solitary or scattered on soil under broadleaf trees.

Comments — *Clitopilus ravus* is characterized by its tawny gray or grayish brown to brown tomentose pileus, absence of pleuro- and cheilocystidia, subfusiform to amygdaliform basidiospores with 4–5 prominent longitudinal ridges, and pileipellis cylindric or clavate terminal pileipellis cells filled with brown non-encrusting intracellular pigment. We place the new species in *Clitopilus* sect. *Clitopilus* based on its well-developed stipe and large basidiospores with fewer than 7 prominent longitudinal ridges (Singer 1986).

Basidiomes are easily distinguished from the white or pale grayish basidiomata of *C. prunulus*, *C. amygdaliformis* and *C. chrischonensis*. With *C. lignyotus*, *C. quisquiliaris*, *C. paxilloides,* and *C. griseobrunneus,* the new species represents the fifth gray or brown member of sect. *Clitopilus*. Although somewhat similar to *C. ravus* in color and stature, *C. lignyotus* is distinguished by a clitocybe-like or (often) phylloporus-like appearance and slightly smaller basidiospores (9.5–13 × 4.5–6.0 μm) with 6 longitudinal ridges (Hongo 1954). *Clitopilus quisquiliaris* differs distinctly in its reddish brown or fuscous brown pileus and smaller basidiospores (8–9.5 × 4.0–5.0 μm) (Noordeloos 1982; Hansen & Knudsen 1992); *C. paxilloides* has a weakly hygrophanous gray-brown pileus with numerous gray-brown spots, a strongly tapering stipe base, and obviously encrusted hyphae in the pileipellis (Noordeloos 1993); and *C. griseobrunneus* has much larger basidiospores (9.7–16.9 × 5.7–7.9 μm) with (5–) 6 (–7) longitudinal ridges and encrusted hyphae in the pileipellis (Baroni & Halling 2000).

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Literature cited

Baroni TJ, Halling RE. 2000. Some *Entolomataceae* (*Agaricales*) from Costa Rica. Brittonia 52: 121–135. http://dx.doi.org/10.2307/2666502

Hansen L, Knudsen H. 1992. Nordic Macromycetes. Vol. 2. *Polyporales*, *Boletales*, *Agaricales*, *Russulales*. Nordsvamp, Copenhagen.

Hongo T. 1954. Note on Japanese larger fungi (5). Journal of Japanese Botany 29(3): 87–92.

Kornerup A, Wanscher JH. 1978. Methuen handbook of colour. Eyre Methuen: London.

Noordeloos ME. 1982. Studies in *Entoloma* 1-5. International Journal of Mycology and Lichenology 1(1): 49–60.

Noordeloos ME. 1993. Studies in *Clitopilus* (*Basidiomycetes, Agaricales*) in Europe. Persoonia 15: 241–248.

Singer R. 1946. The *Boletineae* of Florida with notes on extralimital species IV. The lamellate families (*Gomphidiaceae*, *Paxillaceae* and *Jugasporaceae*). Farlowia 2: 427–567.

Singer R. 1986. The *Agaricales* in modern taxonomy. 4th ed. Koeltz Scientific Books: Koenigstein (Germany).

Vizzini A, Musumeci E, Ercole E, Contu M. 2011. *Clitopilus chrischonensis* sp. nov. (*Agaricales*, *Entolomataceae*), a striking new fungal species from Switzerland. Nova Hedwigia 92(3–4): 425–434. http://dx.doi.org/10.1127/0029-5035/2011/0092-0425

Yang ZL. 2007. *Clitopilus amygdaliformis*, a new species from tropical China. Mycotaxon 100: 241–246.